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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,332	09/24/2003	Ammar Derraa	2269-7416.1US(98-0717.01/	5696
24247	7590	07/19/2007		
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			EXAMINER GUHARAY, KARABI	
			ART UNIT	PAPER NUMBER
			2879	
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			07/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/671,332

Applicant(s)

DERRAA, AMMAR

Examiner

Karabi Guharay

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment, filed on 5/7/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38,47,51,55 and 59-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38,47,51,55,59-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Response to Amendment

Amendment, filed on 5/7/2007 has been considered and entered.

Claims 59-63 are added.

Claim Objections

Claims 61-63 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 61 depends from claim 38, which recites the limitation that the first part is completely wrapped around the second part, which includes a front surface and a rear surface.

Claims 62-63 depend from claim 55. Similarly claim 55 recites first conductive material forming a sheath completely wrapped around the second conductive material, thus includes upper lower left and right side as well as a front and rear surface.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 38, 47, 51, 55, 59-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (US 5663608) and in view of Gates (US 5796121) and further in view of Marieb et al. (US 5909635).

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Regarding claims 38, 47, 51, 55 and 59-63, Jones discloses an integrated circuit (see Figs 5-7, & Fig 26- 27) including a substrate (10, 412, 452) comprising silicon (lines 45-47 of column 5), a first device (multiplicity of emitter 472 of Fig 27), a second device (a conductive grid gate 466), a second layer of material (a dielectric layer 458, 460, 462, 464) comprising silicon (line 40 of column 18), a conductor layer (454, 414) electrically connecting the first device (emitters) to the second device (gate), at least a portion of the conductor disposed adjacent to the first layer (substrate 452, 412), the conductor including a first part, and a second part, the first part comprising chromium and the second part comprising copper (lines 63-65 of column 22), having a multilayer structure of Cr-Cu-Cr.

But Jones fails to disclose second part being aluminum.

However, Gates, in the same field of integrated circuit (TFTs on a substrate) teaches that gate metal layer being a multilayer stack of Cr-Al-Cr (aluminum layer cladded with chromium layer) is a highly preferred metal layer structure for gate electrode layer (lines 17-18 of column 4).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose multilayer of Cr-Al-Cr instead of Cr-Cu-Cr in the device of Jones, since selection of known materials for known purposes is within the skill of art.

Further, Jones discloses that the first part (Cr) is covering upper and lower surface of the second part, but fails to disclose that the first part is forming a sheath

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completely wrapped around an upper surface, lower surface, a left edge, and a right edge of the second part.

However, Marieb et al. teaches a multilayer structure of interconnect conductive layer on a semiconductor substrate and teaches that an interconnect layer (110) of aluminum copper alloy has been completely wrapped around all sides by a second conductive material (see Fig 1D, lines 33-34 of column 3), and further teaches that such encapsulating the interconnect layer by the first material help prevent hillocking from the side walls since the second material is completely surrounding by the first material as opposed to the prior art structure where sides are generally exposed. Since the interconnect layer is completely surrounded by the second material, hillocking from any side of the wire is prevented, thus prevent electromigration (see Abstract and lines 42-47 of column 3).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to wrap the second part completely by the first part as taught by Marieb et al. since this will prevent hillocking from all sides of the interconnect wire, thus prevents electro-migration.

Response to Arguments

Applicant's arguments, filed 5/7/07 has been considered. Arguments concerning Jones reference (see page 6 of Remark) are found to be persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Jones in view of Gates and further in view of Marieb et al.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Guharay
Karabi Guharay
Primary Examiner
Art Unit 2879
7/13/07